capital is being estimated is used in each company's WACC analysis. For all the major debt issues, Attachment 2 shows the bond rating, the face value and the yield to maturity. The yield to maturity is a forward-looking cost of debt that measures the rate that the telephone holding company would have to pay if the bonds were issued as of the current date, and reflects investors' expectations regarding the future returns on these publicly-traded bonds.[7]

14. We understand that the Commission proposes to use embedded debt costs in prescribing a rate of return for incumbent LECs. We do not support this approach as it clearly overstates the current cost of debt where, as here, interest rates have significantly declined. At AT&T's request, however, we have adjusted our cost of capital estimates to reflect the Commission's estimate of embedded debt costs of 7.35%. We calculate a lower bound using the embedded cost of debt, our DCF estimate of the cost of equity, and a book-weighted capital structure. The upper bound is calculated using the embedded cost of debt, our CAPM estimate of the cost of equity, and a market-weighted capital structure. Those results, which are presented in Attachment 13, inflate the cost of capital estimate above the incumbent LECs' true cost of capital even more than the results we present in Attachment 10.

The Cost Of Equity Capital

15. The cost of debt can be computed directly because both the face value of debt and the contractual payments a company agrees to make are fixed. In the case of equity, however,

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[6] The Bond Guide does not always cover all outstanding issues if there are many. It appears that the smaller and shorter term obligations may be excluded. Because interest rates on longer term obligations are generally higher, excluding the smaller and shorter term obligations would have the effect of overstating the cost of debt slightly.

[7] Theoretically, the yield-to-maturity on debt overstates the forward-looking cost of debt because of default risk. The problem raised by risky debt is that only the promised yield is observable, but it is the expected return that is required to estimate the cost of debt. Although the expected return and the default premium sum to the promised yield, neither the expected return nor the default premium can be observed directly. Because of this default risk, the debt cost of capital is actually the yield-to-maturity minus the expected default loss.

there is no face value, and dividends are paid at the discretion of management depending upon business conditions. In addition, the dividend stream does not terminate at a known point. For these reasons, there is no simple arithmetic way to compute the cost of equity capital and more complex approaches must be employed.

16. There are two basic methods for estimating the cost of equity capital. The first is the discounted cash flow, or DCF, method that estimates the present value to investors of future dividends expected to be received. It has been widely adopted by the courts and regulatory agencies in rate of return hearings. An alternative is the capital asset pricing model, or CAPM. Methods based on the CAPM are sometimes referred to as "risk premium" methods because this model provides an estimate of the risk premium associated with investing in specific issues of common stock. When forward-looking inputs are utilized, both methods are forward-looking, as they are based on expectations of future cash flows that will be derived from the investment being evaluated.

17. In our judgment, the DCF method should be the primary analytical approach. Risk premium methods such as the CAPM serve to corroborate the results obtained using the DCF method. We have utilized an average of the costs of equity derived from the DCF and CAPM methods. Because the CAPM results in higher estimates of costs of equity for the telephone holding companies, averaging the DCF and CAPM costs of equity will yield conservatively high estimates of the true cost of equity capital.

The DCF Method

18. The DCF method is based on the realization that the price of a share of stock, P, equals the present value of all future dividends expected to be received on that share, discounted at the cost of common equity. Mathematically, **the DCF model** is written,

$$P = Div_1 / (1+k) + Div_2 / (1+k)^2 + Div_3 / (1+k)^3 + \ldots , \qquad (2)$$

where Div_1 is the expected dividend in year 1, Div_2 is the expected dividend in year 2, etc., and k is the cost of capital.

19. The cost of common equity is calculated by solving the DCF equation for the cost of capital, k. There are two obstacles that make it difficult to solve the equation. First, the number of terms in the equation is infinite. Second, dividends must be forecast for every future year. To surmount these obstacles, simplifying assumptions must be made about the behavior of future dividends.

20. The simplest assumption that can be made is to assume that future dividends will grow forever, and at a constant rate, g, i.e. the growth rate g can be maintained in perpetuity. In this case the DCF equation simplifies to **the constant dividend growth model**,

$$P = Div_1 / (1+k) + Div_1 * (1+g) / (1+k)^2 + Div_1 * (1+g)^2 / (1+k)^3 + \ldots ,$$

which can be solved for k. The solution is well known to be,

$$k = Div_1 / P + g .$$

21. However, a more sophisticated version of the dividend growth model should be used for estimating the cost of capital for a sample of telephone companies. The telephone companies in our group of comparables are composed of a variety of businesses, some of which– such as cellular– are expected to have earnings growth of 30 percent or more in the short run. Such high growth rates are not sustainable into perpetuity, so that the simple constant growth model cannot be applied unless one modifies the growth rate. There is uniform agreement among economists familiar with current cost of capital research on this issue.

22. For example, Stewart Myers and Lynda Borucki state that:

> [f]orecasted growth rates are obviously not constant forever. Variable-growth DCF models, which distinguish short- and long-term growth rates, should give more accurate estimates of the cost of equity. Use of such models guards against naïve projection of short-run earnings changes into the indefinite future.[8]

Ibbotson Associates state that:

> [t]he reason it is difficult to estimate the perpetual growth rate of dividends, earnings, or cash flows is that these quantities do not in fact grow at stable rates forever. Typically it is easier to forecast a company-specific or project-specific growth rate over the short run than over the long run. To produce a better estimate of the equity cost of capital, one can use a two stage DCF model. ... For the resulting cost of capital estimate to be useful, the growth rate over the latter period should be sustainable indefinitely. An example of an indefinitely sustainable growth rate is the expected long-run growth rate of the economy.[9]

Sharpe[10], Alexander and Bailey state that:

> Over the last 30 years, dividend discount models (DDMs) have achieved broad acceptance among professional common stock investors...
>
> Valuing common stock with a DDM technically requires an estimate of future dividends over an infinite time horizon. Given that accurately forecasting dividends three years from today, let alone 20 years in the future, is a difficult proposition, how do investment firms actually go about implementing DDMs?
>
> One approach is to use constant or two-stage dividend growth, models, as described in the text. However, although such models are relatively easy to apply, institutional investors typically view the assumed dividend growth assumptions as overly simplistic. Instead, these investors generally prefer three-stage models, believing that they provide the best combination of realism and ease of application.
>
> ...[M]ost three-stage DDMs make standard assumptions that all companies in the maturity stage have the same growth rates, payout ratios and return on equity.[11]

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[8] Stewart C. Myers and Lynda S. Borucki, *Discounted Cash Flow Estimates of the Cost of Equity Capital—A Case Study*, Financial Markets, Institutions & Instruments, vol. 3, no. 3, New York University Salomon Center, 1994.

[9] *Stock, Bonds, Bills and Inflation, 1996 Yearbook*, Ibbotson Associates, Chicago, pp. 158-159.

[10] Dr. Sharpe is a Nobel-prize winning financial economist.

Damodaran states that:

> While the Gordon growth model is a simple and powerful approach to valuing equity, its use is limited to firms that are growing at a *stable growth rate*...
>
> The second issue relates to what growth rate is reasonable as a *stable growth rate*. Again, the assumption in the model that this growth rate will last forever establishes rigorous constraints on *reasonableness*. A firm cannot in the long term grow at a rate significantly greater than the growth rate in the economy in which it operates. Thus, a firm that grows at 12% forever in an economy growing at 6% will eventually become larger than the economy. In practical terms, the stable growth rate cannot be larger than the nominal (real) growth rate in the economy in which the firm operates, if the valuation is done in nominal (real) terms...
>
> ...If a firm is likely to maintain a few years of above-stable growth rates, an approximate value for the firm can be obtained by adding a premium to the stable growth rate, to reflect the above-average growth in the initial years. Even in this case, the flexibility that the analyst has is limited. The sensitivity of the model to growth implies that the stable growth rate cannot be more than 1% or 2% above the growth rate in the economy. If the deviation becomes larger, the analyst will be better served by using a two-stage or a three-stage model to capture the supernormal or above-average growth and restricting the use of the Gordon growth model to when the firm becomes truly stable.[12]

Copeland, Koller and Murrin echo these observations, stating that "[f]ew companies can be expected to grow faster than the economy for long periods of time."[13]

The Three-Stage DCF Model

23. We utilize a three-stage version of the multi-stage DCF model.[14] A reasonable set of assumptions for the three-stage version assumes that the first stage lasts five years, because

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[11] Sharpe, William F., Gordon J. Alexander and Jeffery V. Bailey, *Investments*, Fifth Edition, Prentice Hall, Englewood Cliffs, New Jersey, 1995, pp. 590-591.

[12] Damodaran, Aswath, *Damodaran on Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, New York, 1994, pp. 99-101.

[13] Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, pg. 295.

that is the longest horizon over which analysts' forecasts of growth are available. The second stage is assumed to last 15 years. During this stage the growth rate gradually tapers from the initial level of the first five years to converge to the growth rate of the U.S. economy as a whole in year 19. From the twentieth year onward the growth rate is set equal to the growth rate for the economy because different rates cannot be sustained into perpetuity.

The First Five Years

24. We use Value Line forecast 1998 dividends for the first forecast year. To estimate growth rates during the remainder of the first five years, we obtained individual company earnings forecast data from Institutional Brokers' Estimate System ("IBES") as of January 1998. The IBES data is compiled through surveys of over 2000 analysts each month regarding their estimates of five-year earnings growth rates for a wide variety of major American companies.[15] These analysts represent over 100 different securities firms. The forecasts are tabulated and widely distributed to subscribers, including large institutional investors, such as pension funds, banks, and insurance companies.

Long-Run Growth

25. We derived long-term growth forecasts by averaging the long-term GNP growth forecasts obtained from the Wharton Econometric Forecasting Associates ("WEFA") Group and from Ibbotson Associates. The WEFA Group is an econometric forecasting organization, formed

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[14] There are numerous formulations of the DCF model of varying complexity. Damodaran, for example, describes several different DCF models in his book. It should be noted that what he calls the "three-stage model" is different from the model we employ. Damodaran's "H Model" is more comparable to the model that we use.

[15] By relying on the IBES data, which is for earnings, there is an implicit assumption that dividends and earnings grow at approximately the same rate over the five-year horizon. There are no growth forecasts beyond a five-year horizon, so an assumption must be made about how the growth rate behaves after that.

in 1987 through a merger of WEFA and Chase Econometrics. Ibbotson Associates is widely known in the fields of finance and valuation as one of the leading providers of securities returns data and publications and has begun to forecast inflation in the last few years. As of December 1997, WEFA predicted an average nominal GNP growth rate of 4.80% from 1998 through 2020. As of the December 1997, Ibbotson Associates forecast long-term inflation to be 3.1% annually. Ibbotson Associates assumes that the historical long-term real GNP growth rate of 3.1% will prevail in the future. Ibbotson Associates adds together the two forecasts to arrive at a nominal long-run GNP growth rate prediction of 6.2%. An average of the WEFA and Ibbotson nominal forecasts, 5.50%, is used for the DCF model.[16]

26. Estimating future growth for a company always involves some uncertainty because no analyst can be expected to have perfect foresight. In some cases, the growth rate may be overestimated and in other cases it may be underestimated. On average, over a group of companies, these estimation errors tend to cancel out so that the estimated average growth rate for the group is more accurate than the estimated growth rate for any individual company.[17] Consequently, the DCF method is applied to all the telephone companies in the previously-identified sample. Given the market price of a company's stock, the current dividend, and the

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[16] Ibbotson Associates is not known as an econometric forecasting firm, and the magnitude of its long-term growth estimate suggests that it is an outlier. DRI, a well-known econometric forecasting firm, forecasts average GNP growth of 1.89% over 25 years and an average CPI of 3.40% over the same period to combine for a long-run economic growth rate of 5.29% as of winter 1997-98. This is in line with WEFA's forecast of 4.80%. Both are much lower than Ibbotson's forecast of 6.20%. However, we conservatively use the higher Ibbotson number as part of the average for estimating the long-term growth rate. This has the effect of increasing the cost of equity estimate.

[17] We refer to estimation error and the desirability of using averages in several discussions in this paper. The following excerpt from *A Guide to Econometrics*, (3rd Edition, The MIT Press, Cambridge, MA, 1992) by Peter Kennedy summarizes in the purpose for using larger samples:

forecast growth rates during each of the three stages, equation (2) can be solved for k. This solution is the estimate of the cost of equity capital.[18]

Cost of Equity Capital— DCF Method

27. Attachment 3 presents the DCF cost of equity capital derived from the three stage model for the telephone company sample. The company-specific estimates range from a low of 8.83 percent to a high of 9.92 percent. The overall value-weighted average cost of equity capital for all of the companies is 9.28 percent.

28. The method that we employ to arrive at a company-specific estimate of a cost of equity is as follows: first, a value-weighted average cost of equity is computed for all companies in Attachment 1 except the target company for which the cost of equity is being estimated. Second, a weighted average which assigns a ¾ weight to the value-weighted average excluding the target company and a ¼ weight to the target company is computed. This weighting is done because there is a trade-off between two considerations. Because the DCF approach, like any approach, estimates the cost of equity capital with error, it is wise to use an average. However, the DCF method does not have a mechanism to adjust for differences in risk caused by differing capital structures employed by the firms in the sample. Therefore, of all the individual companies in the sample, the target company provides the best estimate of its own cost of capital, and is

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"The sampling distribution of most estimators changes as the sample size changes. The sample mean statistic, for example, has a sampling distribution that is centered over the population mean but whose variance becomes smaller as the sample size becomes larger. In many cases it happens that a biased estimator becomes less and less biased as the sample size becomes larger and larger— as the sample size becomes larger its sampling distribution changes, such that the mean of its sampling distribution shifts closer to the true value of the parameter being estimated." (pg. 18)

[18] We utilize an annual DCF model because telephone operating companies receive payments for the use of their network elements on a monthly basis, and consequently, are able to reinvest their cash flows on an approximate monthly basis. Thus, the effective rate that the telephone companies receive is the allowed rate -- as determined in this proceeding -- compounded monthly, regardless of the fact that telephone companies pay dividends quarterly. Consequently, the use of a DCF cost of equity determined using the annual formula is conservatively high.

therefore given a greater than proportional weight in the overall averaging process (i.e. the ¼ weight for the target company).

Capital Asset Pricing Models

29. Capital asset pricing models are mathematical formulas designed to quantify the trade-off between risk and return. The CAPM is designed to give the risk premium, that is the premium over the rate on Treasury securities, required to induce investors to hold specific issues of common stock. The **standard CAPM** is given by the following equation,

Company risk premium = Company "beta" * Market risk premium (3)

30. To apply the CAPM for a given company, it is necessary to estimate both that company's beta and the market risk premium. The CAPM says that only systematic risks, as measured by beta, are associated with a risk premium. Non-systematic risks are not associated with premiums because they can be eliminated by diversification.[19]

Estimating Beta

31. The beta coefficient measures the systematic risk of investing in a company's equity. The CAPM is built upon the insight that investors will be rewarded for bearing only those risks, called systematic risks, that cannot be eliminated by diversification.

32. Beta is calculated by a procedure called regression analysis. Using regression analysis, the sensitivity of a stock to movements in the market can be estimated. This sensitivity is what determines beta. Dow Jones Beta Analytics software available on-line through the Dow Jones News Retrieval Service is used to obtain betas computed on five years of monthly return

data through December 31, 1997 for all of the comparable telephone companies. Returns on the S&P 500 are used as the market proxy. Because beta is measured with error, the average beta over all the comparables is a more accurate indicator of the true beta than any individual estimate of beta.

33. Betas can be calculated over other time periods and using different observation intervals. For example, for newer smaller companies one year of daily data are often used to measure beta. This is because the true underlying beta is likely to be changing for such companies and because five years of data are often not available. The drawback is that the shorter sample period and more frequent observation interval increase measurement error. The telephone company sample is sufficiently large, established and stable that it is more appropriate to use five years of monthly data. This is consistent with the approach used by many institutional providers of betas, including Merrill Lynch, S&P Compustat and Wilshire Associates.[20]

34. While technological and legislative change has impacted the telecommunications industry, it is clear from publicly-available information that such change has been anticipated and considered over time by industry participants, financial analysts and credit-rating agencies. The telephone holding companies trade efficiently, so anticipated risks are impounded in the telephone holding companies stock prices rapidly and fairly.[21]

35. Before averaging individual betas it is necessary to take account of the fact that the various comparable companies have differing amounts of debt in their capital structures. The

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[19] Competition, for example, is a diversifiable risk which does not increase the risk premium according to capital market theory.

[20] Value Line makes a proprietary adjustment to its betas, which artificially brings them closer to 1.0. Effectively, this adjustment process makes companies appear as if their risk premiums more closely match the market risk premium than they really do. We believe that this adjustment process renders the Value Line betas unsuitable for this analysis.

amount of a company's debt leverage affects the riskiness of its stock returns and thereby its beta. To take account of this, a two-step procedure is used to estimate the average beta: first, the raw betas (i.e. betas computed using the Dow Jones software without accounting for capital structure differences) are estimated for each of the sample companies. Second, the raw betas are "unlevered" using standard financial economic formulas and based on the market value debt/equity ratios of each respective company as of December 31, 1997.

The **formula for "unlevering" a raw, or "levered" beta** is,

$$\mathbf{B_u = B_L / [1 + (1 - T_C) \ x \ D/E]} \qquad \mathbf{(4)}$$

where,

B_u = the "unlevered" beta,
B_L = the "levered" beta,
E = the value of the sample company's equity;
T_c = the corporate tax rate (typically an average rate for the sample);
D = the value of the sample company's debt.

36. This unlevering puts all the betas on comparable terms so that they can be averaged. Once the average has been estimated, the beta for any individual company is estimated by "re-levering" using equation (4) solved for B_L, the "levered" beta.

The Telephone Company Beta Estimates

37. Raw (levered) estimates of beta for the telephone companies in the sample are presented in Attachment 4. They vary from a high of 0.83 to a low of 0.57. As discussed above, before calculating an average, the betas must be unlevered to adjust for the different amount of debt issued by the individual companies. Attachment 4 also shows the unlevered betas and their market value weighted average. The weighted average unlevered beta for the entire sample is

[21] To address the question of whether the 5-year betas are sufficiently forward-looking, we also obtained predicted

0.65.[22] The average unlevered beta is re-levered using the formula discussed above to take account of the capital structure of the telephone company for which the cost of capital is being estimated. The result is a range from 0.76 to 0.72.

38. In addition to the betas obtained from Dow Jones Beta Analytics, we obtained predicted betas from BARRA. BARRA (formerly Rosenberg Associates) is an internationally known financial consulting firm providing risk measurement services to investment managers, corporations, consultants, securities dealers and traders, and master custodians. The predicted betas are developed using sophisticated financial modeling techniques which account for factors that impact the future risk of a company. Unlike conventional regression betas, the BARRA betas do not rely solely on historical stock returns and explicitly consider forward-looking projections. Copeland, Koller and Murrin recommend the use of BARRA betas.[23] The predicted BARRA betas as of 12/31/97 — which are levered — vary from a high of 0.69 to a low of 0.77.[24] The value-weighted average of the unlevered BARRA betas is 0.65, the same as we have calculated using historical betas. Therefore, the relevered betas and the CAPM cost of equity would be the same whether we used the historical betas or the BARRA betas.

39. By definition, the beta of all common stock generally (in other words, the beta of the market) is 1.0. Therefore, the beta of the sample of telephone holding company stocks is less than that of common stocks generally. This means that investments in these telephone holding company stocks are less risky than investments in typical industrial companies. Consequently, the

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betas calculated by BARRA, which are discussed later in this affidavit.

[22] Note that the judgmental weighting which we utilized in estimating the average DCF cost of equity is not necessary because betas can be unlevered to adjust for the capital structure leverage of the companies in the sample.

[23] Copeland, *et al., Id.,* pg. 264.

[24] These levered BARRA betas can be compared to the levered betas, varying from 0.83 to 0.57, obtained from Dow Jones Beta Analytics.

cost of capital for the telephone companies should also be less than it is for the average industrial stock.

Estimating the Market Risk Premium

40. The risk premium on the market is the amount of added expected return that investors require to hold a broad portfolio of common stocks instead of risk-free Treasury securities. Because there are over 100 issues of Treasury securities, some convention is required to derive a risk premium. Commonly, the risk premium is measured over both short-term Treasury bills with a maturity of one to three months and long-term Treasury bonds with a maturity of 10 to 30 years. To estimate the market risk premium, we use one-month Treasury bills[25] and 20-year Treasury bonds. Data on these securities are available from Ibbotson Associates and Jeremy Siegel, going back to 1802.

41. The market risk premium can be estimated two ways. First, the DCF approach can be applied to the market as a whole. Second, the premium can be estimated by examining historical data on the difference between the return on a broad portfolio of common stocks and associated Treasury securities.

DCF Estimate Of The Market Risk Premium

42. Two steps are required to estimate the market risk premium using the DCF model. The first step is to compute the DCF expected return (another word for the cost of capital) for the

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[25] Ibbotson Associates interpolates the one-month rate, "Each month a one-bill portfolio containing the shortest term bill having not less than one month to maturity is constructed. (The bill's original term to maturity is not relevant.) To measure holding period returns for the one-bill portfolio, the bill is priced as of the last trading day of the previous month-end and as of the last trading day of the current month." *Stocks, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, Illinois, pg. 67.

market as a whole. Deducting the risk-free rate from the expected return gives the market risk premium.

43. The starting point for estimating the expected return on the market is the S&P 500 index. The sample is then limited to those S&P 500 companies that pay a dividend of at least 2 percent on the grounds that the DCF approach may be less accurate for companies that pay small dividends.[26] For this sample, the three-stage DCF model is applied in the same fashion as it was applied to the sample of telephone holding companies. Finally, the individual DCF estimates for the sample companies are averaged. This average, which is found to be 9.81 percent, is used as an estimate of the expected return on the market as a whole.

44. The market risk premium is computed by subtracting the risk-free rate from the expected return. In the case of the 20-year Treasury bond, this calculation is straightforward. The calculations are shown in Attachment 5. Attachment 5 shows that as of December 1997, the 20-year bond yield was 6.02 percent. Subtracting 6.02 from 9.81 percent gives a market risk premium over long-term Treasury bonds of 3.79 percent.

45. In the case of one-month Treasury bills the situation is more complicated.[27] Because the goal of the analysis is to estimate the long-run cost of capital, using a one-month interest rate can be misleading. A more appropriate choice is the average return on one-month Treasury bills that is expected to obtain over the long-term. This return can be calculated using the following two-step procedure. First, compute the long-run historical difference between the

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[26] With the recent increase in the equity values of S&P 500 companies, the dividend yield calculations produce lower results than in previous years, even though no reduction in dividends occurred. The average dividend yield of the market is about 2% at the measurement date. Therefore, a 2% cut-off is reasonable. All of the companies in the RHBC telephone sample pay dividends greater than 2%. Cincinnati Bell and Century Telephone, which we include in an alternate sample group, pay a dividend yield of less than 2%.

[27] The U.S. Treasury does not issue one-month securities. We use the term "one-month Treasury bill" to refer to the one month rate of return on U.S. Treasury securities as calculated by Ibbotson using the rates of return on market traded U.S. Treasury securities.

return on one-month Treasury bills and the return on 20-year Treasury bonds. Second, subtract that historical difference from the current yield on 20-year bonds. The difference gives a forward-looking market estimate of the average expected yield on one-month Treasury bills over the next 20 years. Attachment 6 shows that the average expected one-month Treasury bill rate over the long run is 4.53 percent as of December 31, 1997. Subtracting this rate from the expected return on the market gives a market risk premium over Treasury bills of 5.28 percent as shown in Attachment 5.

Using The Historical Risk Premium To Estimate The Market Risk Premium

46. The historical risk premium is defined as the historical difference between the return on the stock market and the risk-free rate. Attachment 7 presents both arithmetic and geometric averages of the historical risk premium calculated over various periods of time. In Attachment 7, the S&P 500 Index is used to measure the market. Attachment 7 shows that depending on the period selected and the method for averaging, the historical premium of stocks over Treasury bills ranges from 9.2 to 4.2 percent, while the average premium of stocks over long-term Treasury bonds (total return) ranges from 7.7 to 3.6 percent.

Other Analyses Regarding The Forward-Looking Market Risk Premium

47. Ibbotson has recently cautioned that the long-run stock market returns calculated by his firm may not prove predictive. He believes that the U.S. is not as risky as it was in 1925, suggesting that lower returns will be experienced in the future.[28] Ibbotson also states that his

[28] Clements, Jonathan, "Getting Going, Keeping Perspective: Lower Expectations May Bring Happier Long-Term Results", *The Wall Street Journal*, November 26, 1996.

historical averages overstate the forward-looking cost of equity because of survivorship bias.[29] For example, the U.S. stock market survived despite the Great Depression. As of 1925, however, there existed a risk that the stock market would be entirely wiped out—as happened in Germany, Japan, China and Russia. If these countries were included in an average, historical returns would be lower.[30]

48. Based on an analysis of data going back to 1802, Siegel presents convincing evidence that the risk premium was abnormally high after the U.S. went off the gold standard resulting from unanticipated inflation which reduced the real returns on bonds. He notes that the current equity premium appears to be returning to the 2 - 3 percent range that existed before the second world war.[31] Blanchard also presents evidence that the risk premium has declined to 2 to 3 percent in recent years and argues that either the DCF approach should be employed or more recent data should be used.[32] Similarly, Rappaport opposes the use of long-term averages. He states that the relative risk of bonds has increased over the past two decades, thereby lowering risk premiums to a range from 3 to 5 percent.[33]

49. In light of the results in Attachments 5, 6, and 7, our conclusion is that reasonable estimates of the market risk premium are 7.5 percent over one-month Treasury bills and 5.5 percent over 20-year Treasury bonds. These estimates are conservative (i.e., on the high side) in

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[29] Clements, *Ibid.* See also, Ibbotson, Roger G., and Gary P. Brinson, *GLOBAL INVESTING: The Professional's Guide to the World Capital Markets*, McGraw Hill, Inc., New York, 1993, pg. 171.

[30] Brown, Stephen J., William N. Goetzmann and Stephen A. Ross, "Survival", *The Journal of Finance,* Vol. L, No. 3, July 1995.

[31] Siegel, Jeremy, *Stocks for the Long Run*, Irwin, New York, NY, 1994. See also, Siegel, Jeremy J., "Risk and return: start with the building blocks", *The Financial Times*, May 12, 1997.

[32] Blanchard, Oliver, 1993, "Movements in the Equity Premium", *Brookings Papers on Economic Activity*, 75 (2).

[33] Rappaport, Alfred, *Creating Shareholder Value,*The Free Press, New York, 1998.

the sense that they are above the premiums observed in the more recent periods, and are greater than those implied by the DCF analysis.[34]

The CAPM Estimate Of The Cost Of Equity Capital

50. To review, **the CAPM** says that,

Cost of equity capital = Risk-free rate + Beta * Market risk premium.

51. Applying this equation using the long-run expected one-month Treasury bill rate as the measure of the risk free rate and each company's estimated beta, provides the estimates of the cost of equity for each company presented in Attachment 8.[35] Applying the CAPM equation using the 20-year Treasury bond as the measure of the risk free rate gives similar results which are also shown at Attachment 8. In light of these results, the average of the two is used as the CAPM estimate of the cost of equity capital. The CAPM estimates for the RBHCs range from 9.96% to 10.22%.

Conclusion Regarding The Cost Of Equity

52. A reasonable overall estimate for the cost of equity is approximately the midpoint of the range between the estimates calculated using the three-stage DCF and CAPM methods. The averages of the three-stage DCF and CAPM cost of equity estimates for each company in the

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[34] The reasonableness of this judgment is confirmed by Damodaran, who uses a 5.5% risk premium over 20-year Treasury bonds in his valuation book; and by Copeland, Koller & Murrin, who recommend using a 5 to 6 percent risk premium. From a Wall Street perspective, Merrill Lynch estimated the market risk premium over the long-term Treasury yield to be 5.01% as of January-end 1999. This is 49 basis points lower than the 5.50% market risk premium over long-term Treasuries which is used in this study. In addition, J.P. Morgan used an equity risk premium of 5.00% over the long bond rate for its CAPM calculation of telecommunications company costs of equity in its October 15, 1998 Telecommunications Review.

[35] Notice that in the preceding equation the expected long run Treasury bill rate over the next 20 years is used, not the current one-month Treasury bill rate. It is worth noting that such choice has almost no impact on the final result.

sample are shown in Attachment 8. As discussed above, we view the DCF method as the primary analytical method. Consequently, it is conservative to use an average because the CAPM estimates tend to be slightly higher. Using the average, the resulting range for the cost of equity for the sample companies is 9.61% to 9.80%.

53. Benchmarking cost of equity estimates against non-comparable companies is appropriate only in limited circumstances and, even then, such benchmarking should be used only as a rough rule of thumb. For example, in Attachment 12 we have presented the cost of capital estimates for a group of electric utility companies.[36] While not a set of comparable companies to the RBHCs, the similarity of their regulatory history and the methods by which they provide service as well as the debt and equity costs they incur suggest that the estimates for the RBHCs we calculate in this affidavit are reasonable. A comparison to the S&P Industrials, however, would not be very useful to the Commission because the companies in that set have risks approximating the market as a whole (the S&P 500), not the risks encountered by companies providing core telecommunications services. This observation is confirmed by the S&P Industrials' beta of approximately 1.0 versus a value-weighted average levered beta of 0.75 for the RBHCs.

Capital Structure

54. Most American businesses are financed by a combination of equity (common stock) and debt (including bonds, notes and bank loans). The capital structure refers to the fraction of debt and equity used to finance a business. In terms of the WACC formula presented at the outset, the capital structure is determined by the financing weights, w_e and w_d. The capital

[36] We did not choose this set of electric utilities companies; rather it was chosen by an expert in an unrelated proceeding. Given its size and the fact that all those companies are engaged in the electric utility business, we

structure weights to use when estimating the cost of capital for a company are the long-run target weights that a rational, informed management team would employ. One way to estimate the target weights is to use the actual weights of the company itself and of comparable companies. In this case, however, both the company and the comparables are all riskier than the business in question because of the necessity to use data that are only available at the holding company level.[37]

The Capital Structure For The Telephone Companies

55. The capital structures for the sample of companies as of December 31, 1997 are shown in Attachment 9. Notice that the comparison is made on both a book value and market value weighted basis. However, there remains a debate among academics, practitioners and forensic experts regarding the choice between book and market weights. In traditional rate of return hearings, capital structure is typically presented in terms of book value weights.

56. The average book value debt weight for the sample companies is 53 percent as of December 31, 1997. In comparison, the average market value debt weight is 18 percent. However, market value debt weights of the holding companies probably understate long-run target debt weights in the capital structure of a network access business. Consequently, in this case it is inappropriate to rely solely on current market value weights when calculating the WACC. Therefore, the WACC formula is applied using both debt and market weights to establish a range.

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believe that this set of companies is acceptable for the very limited purpose of supporting the reasonableness of RBHC cost of capital calculations.

[37] The credit-rating agencies have noted the increasing risk-profile of the telephone holding companies in comparison to core telephone operations. For example, Standard & Poor's stated in its Global Sector Review (November 1996, p. 288) that "[p]artially offsetting the solid position of its local exchange companies is the higher-risk profile of GTE's diversified activities, including its wireless and international ventures."

57. The high side of the range is based on the data of telephone holding companies, which are riskier than the network access businesses. Riskier businesses tend to have little debt in their capital structures. The low side of the range attempts to approximate the cost of capital for the network access business as if it were a stand-alone business. As the network access business is a quasi-monopoly and has low risk, it can support a high level of debt in its capital structure. For this reason, it has a lower cost of equity and overall cost of capital than the riskier telephone holding company business. It is reasonable to use the book value of the telephone holding company capital structure as a proxy for the network access company's structure because at the time that the equity proceeds were recorded on their books at what was then market value, the telephone holding companies were much more focused on the traditional monopolistic local exchange business. This is much closer to the business of network access when compared to the various endeavors undertaken by telephone holding companies today. Therefore, the book value is used to provide the lower-bound of the range estimate.

The Appropriate Range For The Weighted Average Cost Of Capital

58. Given the difference between market and book capital structure weights, we believe that it is appropriate to use the average of the range of WACC calculations as the best estimate of the cost of capital for the network element leasing and wholesaling business, as shown in Attachment 10. The midpoint WACCs range from 8.58% to 8.76%.

Public Information Confirming The Reasonableness Of The Estimated Cost Of Capital Range

59. Finally, it is important to note that our estimates of the cost of capital are similar to those used by highly-sophisticated investment banks. For example, in its January 1996 report,

"Regional Bell Operating Companies — Opportunities Ring ... While Danger Calls", Salomon Brothers stated that the RBHCs at that time had an average weighted cost of capital of approximately 8.6%.

60. Similarly, Bell Atlantic submitted to its shareholders a joint proxy statement/prospectus on September 18, 1996 — in conjunction with its proposed merger with NYNEX — in which Bell Atlantic's own investment advisor, Merrill Lynch, performed a DCF analysis of the two companies' relative market values, utilizing a discount rate in the range of 8 to 10 percent for the telephone company portion of their portfolio of businesses.

61. In the Ameritech/SBC merger proxy statement dated October 15, 1998, Salomon Smith Barney performed a DCF valuation analysis of the two companies as part of its fairness opinion. The opinion broke down each company into its component business segments and applied a separate discount rate to each segment. For the telco business segments, excluding long distance, Salomon Smith Barney used a discount rate reflecting a WACC of 8.75% to 9.75%.[38]

62. In its Industry Analysis report on Telecommunication Services dated August 28, 1998, JP Morgan estimated the WACC for the U.S. telecom sector for 1998 at 7.8%. This report also shows that JP Morgan estimates that the WACC for the telecom sector for the period 1995-2002 will stay within the range of 7.6 to 7.8%, a range well below any of the midpoint WACCs for the companies in our sample.

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[38] It is worth noting that Salomon Smith Barney uses higher ranges of 10.50% to 11.50% for long distance business segments, 10.00% to 11.00% for cellular business segments, and 12.50% to 13.50% for PCS business segments. This is consistent with our position that local telephone company operations are less risky than other telecommunications segments and that telephone holding companies are engaged in many of these riskier business activities.

The Cellular Argument

63. We have reviewed growth forecasts and brokerage house reports prepared by analysts for both RBHC's and cellular communications companies. It is evident from both the forecasts and the analysts' discussions of growth that they clearly recognize the fact that wireless businesses – whether they are stand-alone companies, or are owned by telephone holding companies such as the RBHCs – are experiencing dramatic growth rates which are much higher than the growth rates for core wireline businesses. In fact, the RBHCs fully disclose the high growth rates experienced by their wireless businesses in their public filings, such as their Forms 10-K. As Attachment 12 illustrates, these high wireless business growth rates are reflected in the analyst's growth forecasts.

DECLARATION

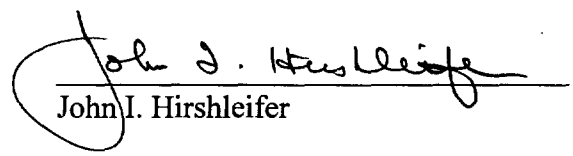
I declare under penalty of perjury that the foregoing is true and correct. Executed on March 15, 1999.

Bradford Cornell

Bradford Cornell

DECLARATION

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 15, 1999.



John I. Hirshleifer

Attachment 1

Regional Bell Holding Companies

Company	Market Value of Equity at 12/31/97($ mil)	1997 Revenues ($ mil)	1997 Book Value of Plant ($ mil)	1997 Access Lines in Service (mil)
Ameritech	44,054	16,000	13,980	20.5
Bell Atlantic	70,674	29,900	16,765	40.0
BellSouth	55,839	20,365	22,200	23.7
SBC Communications	67,140	24,800	27,400	34.2
U.S. West Comm.	21,824	10,480	14,100	16.0

Sources: Standard & Poor's Industry Survey; Value Line Inc.; Dow Jones News Retrieval; SBC Communications 1997 10-K

Attachment 2

Summary of Cost of Debt for Regional Bell Holding Companies

		as of 12/31/97
AIT	**AMERITECH**	6.78%
BEL	**BELL ATLANTIC**	6.75%
BLS	**BELLSOUTH**	6.65%
SBC	**SBC COMMUNICATIONS**	6.72%
USW	**US WEST**	6.86%

Details are presented in Attachments 2-1 and 2-5.

AMERITECH Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
Ameritech Capital Funding			
Gtd Deb 7 1/2s 2005	AA+	192	6.24%
Illinois Bell Telephone			
1st H 4 3/8s 2003	AAA	50	5.97%
1st K 7 5/8s 2006	AAA	200	7.38%
Deb 7 1/8s 2023	AAA	100	6.93%
Deb 7 1/4s 2024	AAA	200	6.94%
Deb 6 5/8s 2025	AAA	100	6.77%
Deb 8 1/2s 2026	AAA	275	8.11%
Nts 5.80s 2004	AAA	100	6.10%
Indiana Bell Telephone			
Deb 4 3/8s 2003	AAA	20	6.13%
Deb 4 3/4s 2005	AAA	25	6.17%
Deb 5 1/2s 2007	AAA	40	6.27%
Deb 7.30s 2026	AAA	150	6.51%
Michigan Bell Telephone			
Deb 6 3/8s 2005	AAA	125	6.40%
Deb 7 3/4s 2011	AAA	150	7.54%
Deb 7s 2012	AAA	75	6.98%
Deb 7.85s 2022	AAA	200	6.58%
Deb 7 1/2s 2023	AAA	200	7.02%
Nts 5 7/8s '99	AAA	150	5.87%
Nts 6 3/8s 2002	AAA	100	6.00%
Ohio Bell Telephone			
Deb 5s 2006	AAA	60	6.28%
Deb 5 3/8s 2007	AAA	75	6.19%
Deb 6 3/4s 2008	AAA	55	6.57%
Deb 7 1/2s 2011	AAA	100	7.32%
Deb 7 7/8s 2013	AAA	200	7.64%
Deb 7.85s 2022	AAA	100	7.12%
Nts 5 3/4s 2000	AAA	100	5.92%
Nts 6 1/8s 2003	AAA	150	6.10%
Wisconsin Bell Inc			
Deb 7 1/4s 2007	AAA	90	7.04%
Deb 6 3/4s 2024	AAA	150	6.92%
Deb 6.35s 2026	AAA	125	6.01%
Wisconsin Telephone (Now Wisconsin Bell Inc)			
Deb 4 3/8s 2002	AAA	20	6.07%
Deb 6 1/4s 2004	AAA	50	6.37%
		Weighted Average:	6.78%

Source: Standard & Poor's Bond Guide, January 1998.

Bell Atlantic Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
Bell Atlantic--N.J. (was New Jersey Bell Tel.)			
Deb 5 7/8s 2004	AA	250	6.10%
New Jersey Bell Tel. (Now Bell Atlantic--N.J.)			
Deb 4 7/8s 2000	AA	20.0	5.99%
Deb 7 1/4s 2002	AA	100	6.04%
Deb 4 5/8s 2005	AA	40.0	6.13%
Deb 5 7/8s 2006	AA	55.0	6.30%
Deb 6 5/8s 2008	AA	50.0	6.47%
Deb 7 1/4s 2011	AA	125	7.14%
Deb 7 3/8s 2012	AA	75.0	7.32%
Deb 8s 2022	AA	200	6.59%
Deb 7 1/4s 2023	AA	100	6.97%
Deb 6.80s 2024	AA	100	6.94%
Deb 7.85s 2029 (HRO on 11-15-99 @ 100)	AA	150	6.43%
Bell Tel. of Penna (Now Bell Atlantic--Pennsylvania)			
Deb 4 3/4s 2001	AA	50.0	6.09%
Deb 6 5/8s 2002	AA	100	6.10%
Deb 4 3/8s 2003	AA	50.0	6.05%
Deb 6 1/8s 2003	AA	150	6.09%
Deb 7 3/8s 2007	AA	150	6.22%
Deb 6 3/4s 2008	AA	100	6.61%
Deb 7 1/8s 2012	AA	75.0	7.07%
Deb 7 1/2s 2013	AA	125	7.32%
Deb 7.70s 2023	AA	100	7.13%
Deb 8.35s 2030 (HRO on 11-15-99 @ 100)	AA	175	6.40%
Deb 8 3/4s 2031	AA	125	6.67%
Deb 7 3/8s 2033	AA	225	7.06%
Chesapeake Pot. Tel Md (Now Bell Atlantic-Maryland)			
Deb 5 7/8 '99	AA	100	5.95%
Deb 4 3/8s 2002	AA	50	6.12%
Deb 6s 2003	AA	200	6.08%
Deb 5 7/8s 2004	AA	60	6.33%
Deb 6 5/8s 2008	AA	75	6.66%
Deb 7 1/4s 2012	AA	50	7.15%
Deb 7.15s 2023	AA	250	6.81%
Deb 8s 2029 (HRO on 10-15-96 @ 100)	AA	50	6.56%
Deb 8.30s 2031 (HRO on 8-1-96 @ 100)	AA	100	6.61%

Bell Atlantic Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
Chesapeake & Pot. Tel Va (Now Bell Atlantic-Virginia)			
Deb 7 1/8s 2002	AA+	100	6.24%
Deb 5 1/4s 2005	AA+	50	6.30%
Deb 6 1/8s 2005	AA+	100	6.29%
Deb 5 5/8s 2007	AA+	65	6.31%
Deb 6 3/4s 2008	AA+	70	6.60%
Deb 7 1/4s 2012	AA+	50	7.22%
Deb 7 5/8s 2012	AA+	100	6.39%
Deb 7 7/8s 2022	AA+	100	6.62%
Deb 7 1/4s 2024	AA+	75	7.07%
Deb 7s 2025	AA+	125	7.05%
Deb 8 3/8s 2029 (HRO on 10-1-99 @ 100)	AA+	100	6.55%
Chesapeake & Pot. Tel Wash DC (Now Bell Atlantic-Washington D.C.)			
Deb 5 5/8s 2006	AA	25	6.40%
Deb 7s 2009	AA	50	6.87%
Deb 7 3/4s 2013	AA	60	7.68%
Deb 7 3/4s 2023	AA	90	7.10%
Chesapeake & Pot. Tel W Va (Now Bell Atlantic - West Virginia)			
Deb 5s 2000	AA+	25	6.06%
Deb 6.05s 2003	AA+	50	6.19%
Deb 7s 2004	AA+	50	6.18%
Deb 7 1/4s 2009	AA+	40	6.99%
Deb 7 1/4s 2013	AA+	50	7.24%
Diamond State Telephone (Now Bell Atlantic-Delaware)			
Deb 6 1/8s 2003	AA+	20	6.20%
Deb 4 5/8s 2005	AA+	7	6.11%
Deb 7s 2008	AA+	10	7.13%
Deb 7 3/4s 2013	AA+	15	7.49%
Deb 8 3/8s 2019	AA+	15	6.41%
Deb 7s 2023	AA+	20	6.77%
Deb 8 5/8s 2031	AA+	15	6.75%

Bell Atlantic Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
NYNEX Capital Funding			
(Gtd) M-T Nts 'B' 7.59s '99	A+	7.0	5.96%
(Gtd) M-T Nts 'B' 7.60s '99	A+	30.7	5.97%
(Gtd) M-T Nts 'B' 7.61s '99	A+	28.0	5.98%
(Gtd) M-T Nts 'B' 7.62s '99	A+	21.0	5.99%
(Gtd) M-T Nts 'B' 7.63s '99	A+	10.0	6.00%
(Gtd) M-T Nts 'B' 7.66s '99	A+	10.0	6.03%
(Gtd) M-T Nts 'B' 7.64s '99	A+	9.0	6.01%
(Gtd) M-T Nts 'B' 8.11s '99	A+	20.5	5.99%
(Gtd) M-T Nts 'B' 8.10s '99	A+	42.0	6.05%
(Gtd) M-T Nts 'B' 8.10s '99	A+	15.0	6.05%
(Gtd) M-T Nts 'B' 8.14s '99	A+	10.0	6.01%
(Gtd) M-T Nts 'B' 8.35s '99	A+	25.0	6.01%
(Gtd) M-T Nts 'B' 8.06s 2001	A+	10.0	6.18%
(Gtd) M-T Nts 'B' 8.22s 2001	A+	65.0	6.16%
(Gtd) M-T Nts 'B' 8.40s 2001	A+	10.0	6.19%
(Gtd) M-T Nts 'B' 8.32s 2004	A+	10.0	6.30%
(Gtd) M-T Nts 'B' 8 3/4s 2004	A+	150	6.33%
(Gtd) M-T Nts 'B' 8.61s 2006	A+	10.0	6.35%
New York Telephone Co			
Ref M 4 5/8s 2002	A+	60	6.42%
Ref N 4 1/4s 2000	A+	70	6.55%
Ref O 4 5/8s 2004	A+	130	6.24%
Ref P 4 7/8s 2006	A+	100	6.50%
Ref Q 6s 2007	A+	75	6.42%
Ref R 7 1/2s 2009	A+	150	7.23%
Ref T 7 3/4s 2006	A+	200	7.50%
Ref V 7 3/8s 2011	A+	200	7.22%
Deb 6 1/2s 2005	A+	200	6.52%
Deb 8 5/8s 2010	A+	150	7.33%
Deb 7s 2013	A+	100	6.76%
Deb 7s 2013	A+	100	7.05%
Deb 7 7/8s 2017	A+	200	7.65%
Deb 7 5/8s 2023	A+	100	7.33%
Deb 6.70s 2023	A+	250	7.21%
Deb 7 1/4s 2024	A+	450	7.26%
Deb 7s 2025	A+	250	7.01%
Deb 9 3/8s 2031	A+	200	8.51%
Deb 7s 2033	A+	200	7.00%
Nts 5 1/4s '98	A+	100	6.40%
Nts 5 7/8s 2003	A+	200	6.22%
Nts 5 5/8s 2003	A+	150	6.35%
Nts 6 1/4s 2004	A+	150	5.88%

Bell Atlantic Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
New England Tel. & Tel			
Deb 4 5/8s '99	AA	45	6.63%
Deb 4 1/2s 2002	AA	50	6.04%
Deb 4 5/8s 2005	AA	60	6.21%
Deb 6 1/8s 2006	AA	100	6.41%
Deb 7 3/8s 2007	AA	200	7.23%
Deb 6 3/8s 2008	AA	125	6.44%
Deb 7 7/8s 2022	AA	100	7.50%
Deb 6 7/8s 2023	AA	250	6.93%
Deb 7 7/8s 2029	AA	350	7.30%
Deb 9s 2031	AA	100	8.34%
Nts 5.05s '98	AA	100	6.77%
Nts 6.15s '99	AA	100	6.14%
Nts 5 3/4s 2000	AA	100	6.15%
Nts 8 5/8s 2001	AA	100	6.40%
Nts 6 1/4s 2003	AA	225	6.16%
		Weighted Average:	6.75%

Source: Standard & Poor's Bond Guide, January 1998.

BELLSOUTH Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
BellSouth Capital Funding (Issued under support agreement w/BellSouth)			
Deb 6.04s 2026	AAA	300	5.98%
Deb 7.12s 2097	AAA	500	6.79%
BellSouth Telecommunications			
Deb 5 7/8s 2009	AAA	350	6.09%
Deb 7s 2025	AAA	300	6.72%
Deb 8 1/4s 2032	AAA	250	7.67%
Deb 7 7/8s 2032	AAA	300	7.47%
Deb 7 1/2s 2033	AAA	300	7.19%
Deb 6 3/4s 2033	AAA	400	6.90%
Deb 7 5/8s 2035	AAA	300	7.21%
Deb 5.85s 2045	AAA	300	6.05%
Deb 7s 2095	AAA	500	6.80%
Nts 6 1/2s 2000	AAA	275	5.98%
Nts 6 1/4s 2003	AAA	450	6.11%
Nts 6 3/8s 2004	AAA	200	6.21%
Nts 7s 2005	AAA	150	6.27%
Nts 6 1/2s 2005	AAA	300	6.12%
Southern Bell Tel. & Tel (Now BellSouth Telecommunications)			
Deb 4 3/8s '98	AAA	70	8.06%
Deb 4 3/4s 2000	AAA	100	6.46%
Deb 4 3/8s 2001	AAA	75	6.49%
Deb 4 3/8s 2003	AAA	70	6.37%
Deb 6s 2004	AAA	100	5.91%
Deb 7 5/8s 2013	AAA	350	7.36%
		Weighted Average:	6.65%

Source: Standard & Poor's Bond Guide, January 1998.

SBC Communications Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
Southwestern Bell Cap			
M-T Nts 'D' 6 1/4s '98	AA-	10.0	6.09%
M-T Nts 'D' 7s '99	AA-	8.00	6.12%
M-T Nts 'D' 7s '99	AA-	15.0	6.07%
M-T Nts 'D' 8.48s '99	AA-	75.0	7.28%
M-T Nts 'D' 6 3/4s 2000	AA-	20.0	6.10%
M-T Nts 'D' 6 3/4s 2000	AA-	15.0	6.75%
M-T Nts 'D' 7.83s 2000	AA-	19.0	6.13%
M-T Nts 'D' 7.84s 2000	AA-	18.0	6.14%
M-T Nts 'D' 7.57s 2000	AA-	15.0	6.13%
M-T Nts 'D' 7.37s 2002	AA-	15.0	6.26%
M-T Nts 'D' 7 1/4s 2003	AA-	11.0	6.25%
M-T Nts 'D' 7.3 s 2003	AA-	10.0	6.24%
M-T Nts 'D' 7.1 s 2003	AA-	5.00	6.26%
M-T Nts 'D' 7.3 s 2003	AA-	6.00	6.26%
M-T Nts 'D' 7.05 s 2004	AA-	10.0	6.35%
M-T Nts 'D' 8.15 s 2005	AA-	16.0	7.09%
M-T Nts 'D' 7.35 s 2010	AA-	20.0	6.49%
Southwestern Bell Tel			
Deb 5 7/8s 2003	AA	150	6.26%
Deb 5 3/8s 2006	AA	150	6.36%
Deb 6 3/4s 2008	AA	150	6.55%
Deb 7 3/4s 2009	AA	125	7.47%
Deb 6 7/8s 2011	AA	200	6.87%
Deb 7 3/8s 2012	AA	175	7.29%
Deb 7 5/8s 2013	AA	300	7.45%
Deb 7s 2015	AA	250	6.56%
Deb 7 5/8s 2023	AA	200	7.31%
Deb 6 5/8s 2024	AA	200	6.91%
Deb 7 1/4s 2025	AA	150	6.95%
Deb 7.20s 2026	AA	300	7.04%
Deb 7 3/8s 2027	AA	150	7.03%
Deb 7s 2027	AA	100	6.97%
Nts 6 1/8s 2000	AA	150	6.06%
Nts 6 3/8s 2001	AA	200	6.07%
Nts 6 1/4s 2002	AA	150	6.09%
Nts 5 3/4s 2004	AA	200	6.35%
Nts 6 5/8s 2005	AA	150	6.49%
Nts 6 5/8s 2007	AA	250	6.38%
Nts 6 3/8s 2007	AA	100	6.41%
M-T Nts 'C' 7 1/4s 2010	AA	15	6.43%
M-T Nts 'C' 7.55s 2005	AA	15	6.31%
M-T Nts 'C' 7 1/2s 2005	AA	15	6.31%
M-T Nts 'C' 7.67s 2007	AA	15	6.33%
M-T Nts 'C' 6.55s 2008	AA	30	6.39%
M-T Nts 'C' 7.60s 2007	AA	18	6.34%
M-T Nts 'C' 7.21s 2010	AA	50	6.44%
M-T Nts 'C' 7.18s 2010	AA	20	6.44%

M-T Nts 'C' 7.22s 2010	AA	23	6.43%
Pacific Bell			
Deb 5 7/8s 2006	AA-	250	6.29%
Deb 6 7/8s 2006	AA-	250	6.38%
Deb 6 7/8s 2023	AA-	100	7.07%
Deb 7 3/8s 2025	AA-	350	7.14%
Deb 7 1/8s 2026	AA-	625	6.67%
Deb 7 1/4s 2027	AA-	100	7.04%
Deb 8 1/2s 2031	AA-	225	7.79%
Deb 7 3/4s 2032	AA-	300	7.32%
Deb 7 1/2s 2033	AA-	400	7.24%
Deb 6 5/8s 2034	AA-	550	6.82%
Deb 7 3/8s 2043	AA-	300	6.96%
Nts. 8.70s 2001	AA-	200	6.21%
Nts 7 1/4s 2002	AA-	300	6.22%
Nts 7s 2004	AA-	325	6.31%
Nts 6 1/4s 2005	AA-	325	6.31%
Nts 6 5/8s 2009	AA-	150	6.58%
Pacific Telephone & Tel			
Deb 4 5/8s '99	AA-	100	5.99%
Deb 4 5/8s 2000	AA-	125	5.96%
Deb 6s 2002	AA-	130	6.30%
Deb 6 1/2s 2003	AA-	165	6.47%
Deb 7 1/4s 2008	AA-	175	7.14%
		Weighted Average:	6.72%

Source: Standard & Poor's Bond Guide, January 1998.

US WEST Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil $)	Yield to Maturity as of 12/31/97
US WEST Communications			
Deb 7 1/2s 2023	A	484	7.26%
Deb 7 1/4s 2025	A	250	6.77%
Deb 7.20s 2026	A	250	7.13%
Deb 8 7/8s 2031	A	250	7.92%
Deb 6 7/8s 2033	A	1000	7.15%
Deb 7 1/4s 2035	A	250	7.07%
Deb 7 1/8s 2043	A	250	7.10%
Nts 6 3/8s 2002	A	250	6.16%
Nts 6 5/8s 2005	A	250	6.35%
Nts 6 1/8s 2005	A	150	6.31%
Mountain States Tel&Tel (Now US West Communications)			
Deb 5s 2000	A	40.0	5.96%
Deb 4 1/2s 2002	A	50.0	6.14%
Deb 5 1/2s 2005	A	40.8	6.20%
Deb 6s 2007	A	70.2	6.32%
Deb 7 3/8s 2030	A	55.2	6.68%
Deb 9 1/2s 2000	A	100.0	6.06%
Northwestern Bell Tel (Merged into US West Communications)			
Deb 4 7/8s '98	A	35.4	5.77%
Deb 6s 2001	A	50.0	6.15%
Deb 4 3/8s 2003	A	40.0	6.21%
Deb 6 1/4s 2007	A	89.7	6.47%
Nts 9 1/2s 2000	A	75.0	6.00%
Pacific NorthwestBellTel (Merged into US West Communications)			
Deb 4 1/2s 2000	A	50	6.01%
Deb 4 3/8s 2002	A	50	6.19%
Deb 4 1/2s 2003	A	50	6.22%
		Weighted Average:	6.86%

Source: Standard & Poor's Bond Guide, January 1998.

3-Stage DCF Model Estimates of Cost of Equity
For Telephone Holding Companies

Company	Stock Price as of 12/31/97	1998 Dividend per Value Line	5-year I/B/E/S Forecast Growth Rate as of 1/98	Sustainable Growth Rate	COST OF EQUITY		
					15-yr Linear Convergence (A)	Weighted Average Excluding Company (B)	Cost of Equity 1/4 x (A) + 3/4 x (B)
Ameritech	$80.500	$2.40	8.14%	5.50%	9.22%	9.29%	9.27%
Bell Atlantic	$91.000	$3.08	7.89%	5.50%	9.62%	9.15%	9.27%
BellSouth	$56.312	$1.50	8.11%	5.50%	8.83%	9.40%	9.26%
SBC Communications	$73.250	$1.87	9.64%	5.50%	9.12%	9.33%	9.28%
U.S. West	$45.125	$2.14	4.62%	5.50%	9.92%	9.22%	9.39%
				MKT-WEIGHTED AVERAGE:	**9.28%**		

Sources: Dow Jones News Retrieval; Value Line, Inc.; I/B/E/S.

Estimated Betas For the Comparable Companies
(60 Monthly Observations -- Period Ending 12/31/97)

Ticker Symbol	Company	Levered Beta [1]	Unlevered Beta [2]	Re-levering of Average Unlevered Beta Using Company's Capital Structure
AIT	Ameritech	0.78	0.71	0.72
BEL	Bell Atlantic	0.83	0.71	0.76
BLS	BellSouth	0.76	0.67	0.73
SBC	SBC Communications	0.68	0.60	0.73
USW	U.S. West	0.57	0.49	0.76
Value-Weighted Average		**0.75**	**0.65**	

[1] The Levered Beta is measured relative to the S&P 500.

[2] Assumed tax rate: 37.5%

Sources: Dow Jones Beta Analytics and Attachment JH-10.

Attachment 5

Risk Premium Computed from DCF Expected Market Return

	Expected Long-Run Yield As Of December 1997	Expected Return on Stock Market	Implied Risk Premium
1-Month Treasury Bill	4.53%	9.81%	5.28%
20-Year Treasury Bond	6.02%	9.81%	3.79%

Sources: I/B/E/S; Ibbotson Associates; The WEFA Group.

Expected Long-Run One-Month Treasury Bill Yield For December 1997

Calculation of Historical Term Premium for Long-Term Treasury Bonds over One-Month Treasury Bills

Average Long-Term Treasury Bond Return		Average One-Month Treasury Bill Return		Historical Term Premium
5.24%	-	3.75%	=	1.49%

Estimation of Long-Run Treasury Bill Yield Based on Historical Term Premium

Long-Term Treasury Bond Yield December 1997		Historical Term Premium		Long-Run Expected Treasury Bill Yield December 1997
6.02%	-	1.49%	=	4.53%

Sources: Dimensional Fund Advisors; Federal Reserve Weekly Bulletin.

Stock Market Premium Analysis

Year	Stock Returns	One-month Treasury Bill Returns	Long-Term Treasury Bond Total Returns
Period	Arithmetic Average	Arithmetic Average	Arithmetic Average
1802-1997	9.79% [1][3][4]	4.31%	5.07%
1926-1997	12.96% [2][3][4]	3.81%	5.59%
1951-1997	14.06% [2][3][4]	5.29%	6.37%
1971-1997	14.56% [2][3][4]	6.88%	10.02%

Period	Stock Premium Over Bills	Stock Premium Over Bond Total Returns
1802-1997	5.49%	4.73%
1926-1997	9.15%	7.36%
1951-1997	8.77%	7.69%
1971-1997	7.68%	4.54%

Year	Stock Returns	One-month Treasury Bill Returns	Long-Term Treasury Bond Total Returns
Period	Geometric Average	Geometric Average	Geometric Average
1802-1997	8.39% [1][3][4]	4.21%	4.84%
1926-1997	11.00% [2][3][4]	3.76%	5.22%
1951-1997	12.80% [2][3][4]	5.25%	5.86%
1971-1997	13.32% [2][3][4]	6.85%	9.39%

Period	Stock Premium Over Bills	Stock Premium Over Bond Total Returns
1802-1997	4.18%	3.55%
1926-1997	7.24%	5.77%
1951-1997	7.55%	6.94%
1971-1997	6.48%	3.93%

[1] Jeremy J. Siegel, "Stocks for the Long-Run", (New York: Irwin), 1994.

[2] *Stocks, Bonds, Bills and Inflation, 1996 Yearbook*, Ibbotson Associates, Chicago, Illinois.

[3] 1996 returns are from Dimensional Fund Advisors.

[4] 1997 returns are from Ibbotson Associates.

Model Estimates of Cost of Equity
For Telephone Holding Companies

Company	DCF Weighted Cost of Equity	Beta	CAPM Cost of Equity			COST OF EQUITY (AVERAGE of DCF and CAPM Average)
			1-month Treasury Bills	20-yr Treasury Bonds	Average	
Ameritech	9.27%	0.72	9.93%	9.98%	9.96%	9.61%
Bell Atlantic	9.27%	0.76	10.23%	10.20%	10.22%	9.74%
BellSouth	9.26%	0.73	10.01%	10.04%	10.02%	9.64%
SBC Communications	9.28%	0.73	10.01%	10.04%	10.02%	9.65%
U.S. West	9.39%	0.76	10.23%	10.20%	10.22%	9.80%
Weighted Average	**9.28%**				**10.08%**	**9.68%**

Capital Structure of Telephone Holding Companies
As of Year-End 1997

Company	Short-Term Debt	Long-Term Debt	BASED ON BOOK VALUE			BASED ON MARKET VALUE		
			Total Debt	Preferred Stock	Common Equity	Total Debt	Preferred Stock	Common Equity
Ameritech	19%	29%	48%	0%	52%	15%	0%	85%
Bell Atlantic	20%	41%	61%	0%	39%	22%	0%	78%
BellSouth	14%	28%	42%	0%	58%	17%	0%	83%
SBC Communications	8%	50%	59%	0%	41%	17%	0%	83%
U.S.West	6%	51%	57%	0%	43%	21%	0%	79%
Value-Weighted Average:			**53%**	**0%**	**47%**	**18%**	**0%**	**82%**

Sources: Companies' SEC Forms 10-K for 1996; market value of common equity based on closing stock price as of December 31, 1996.

Attachment 10

Model Estimates of Cost of Capital for RBHCs

Company	WEIGHTED AVERAGE COST OF CAPITAL		
	MIN	MIDPOINT	MAX
Ameritech	8.11%	8.61%	9.10%
Bell Atlantic	8.16%	8.68%	9.20%
BellSouth	8.05%	8.58%	9.10%
SBC Communications	8.10%	8.61%	9.12%
U.S. West Communic	8.24%	8.76%	9.27%
Market Weighted Avg.	**8.12%**	**8.63%**	**9.15%**

Model Estimates of Cost of Capital for

Electric Utilities

Company	Cost of Debt	Levered Beta	Relevered Beta [2]	Cost of Equity	Book Debt Percentage	Market Debt Percentage	WEIGHTED AVERAGE COST OF CAPITAL MIN	MIDPOINT	MAX
BEC Energy	7.27%	0.65	0.60	9.12%	51%	37%	8.14%	8.26%	8.38%
Central Hudson Gas & Elec. Corp.	8.13%	0.38	0.56	8.92% [3]	41%	31%	8.50%	8.55%	8.60%
Consolidated Edison Co. of NY	6.50%	0.73	0.54	8.94%	40%	27%	7.65%	7.81%	7.96%
DTE Energy Co.	6.11%	0.62	0.64	9.30%	53%	42%	7.61%	7.81%	8.02%
Eastern Utilities Associates	6.78% [1]	0.75	0.66	9.44%	53%	44%	8.03% [1]	8.20%	8.38% [1]
GPU, Inc.	6.84%	0.70	0.71	9.51%	64%	50%	8.10%	8.27%	8.44%
New England Electric System	6.78% [1]	0.42	0.61	9.27%	51%	38%	7.95% [1]	7.77%	7.60% [1]
OGE Energy Corp	7.00%	0.45	0.54	9.02%	46%	27%	7.95%	8.08%	8.21%
PECO Energy Co.	7.10%	0.77	0.71	9.14%	63%	49%	8.06%	8.19%	8.32%
Pinnacle West Capital Corp	7.24%	0.49	0.61	9.11%	53%	39%	8.12%	8.24%	8.36%
PP&L Resources, Inc.	6.92%	0.41	0.66	9.50%	53%	45%	8.13%	8.30%	8.47%
Market Weighted Avg.	**6.78%**	**0.62**		**9.19%**	**53%**	**40%**	**7.91%**	**8.07%**	**8.22%**

[1] These companies had no public debt per S&.P bond guide. The market-weighted average of the other companies in the sample is used for purposes of the WACC calculation

[2] The market-weighted unlevered beta is 0.44.

[3] There is no IBES growth rate for Hudson. Cost of Equity is only based on CAPM.

Comparison of Earnings Growth Forecasts
for Telephone Holding Companies[1] and Wireless Companies

Ticker	Company	IBES 5-yr earnings growth forecast Jan-98
	Telephone Holding Companies	
AIT	Ameritech	8.14%
BEL	Bell Atlantic	7.89%
BLS	BellSouth	8.11%
SBC	SBC Comm.	9.64%
USW	US West	4.62%
AT	ALLTEL	9.86%
CSN	Cincinnati Bell	17.00%
GTE	GTE	8.93%
SNG	So. New England	6.50%
	Mkt-Wtd Average:	**8.41%**
	Wireless Companies	
ATI	Airtouch	34.88%
MTEL	Mobile Telecom	24.33%
NXTL	Nextel Communications	32.50%
USM	U S Cellular	26.63%
	Mkt-Wtd Average:	**33.28%**

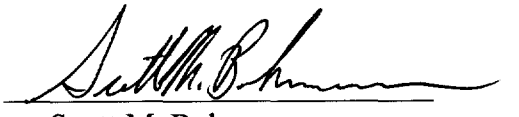
[1] Telephone holding companies generally own cellular, paging and other businesses riskier than local telephone operations.

Zone of Reasonableness Based on Commission Mandates and Model Estimated Costs of Equity

	Cost of Debt	Cost of Equity	Capital Structure	WACC
Lower Bound	7.35%	9.28%	42.88%	8.45%
	Commission's Embedded Cost of Debt	DCF Model	Commission's ARMIS Debt Ratio	
Upper Bound	7.35%	10.08%	18.00%	9.59%
	Commission's Embedded Cost of Debt	CAPM Model	Market-Weighted Debt Ratio	

CERTIFICATE OF SERVICE

I, Scott M. Bohannon, do hereby certify that on this 16th day of March, 1999, I caused a copy of the foregoing Responsive Submission of AT&T Corp. to Prescription Proceeding Direct Cases and Reply Comments On The Notice of Proposed Rulemaking to be served upon each of the parties listed on the attached Service List by U.S. First Class mail, postage prepaid.



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